

15 FEB 2006

SEQUENCE LISTING

<110> SHIRE BIOCHEM INC.

<120> POLYPEPTIDES OF STREPTOCOCCUS PYOGENES

<130> 51564-44

<140> PCT/CA2004/001510

<141> 2004-08-16

<150> US 60/495,094

<151> 2003-08-15

<160> 44

<170> PatentIn version 3.3

<210> 1

<211> 537

<212> DNA

<213> Streptococcus pyogenes

<400> 1

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gttggtcaaa cagctgctta catccgtagc ttgcgttcac cagagcctta caaaggcaaa      480
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<212> PRT

<213> Streptococcus pyogenes

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20          25          30
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Leu Thr Arg Glu Phe Asn Lys Asn Ile Glu Ile Lys Val Glu Gly Thr  
 35 40 45

Glu Ile Thr Val Val Arg Pro Asn Asp Ser Lys Glu Met Lys Thr Ile  
 50 55 60

His Gly Thr Thr Arg Ala Asn Leu Asn Asn Met Val Val Gly Val Ser  
 65 70 75 80

Glu Gly Phe Lys Lys Asp Leu Glu Met Lys Gly Val Gly Tyr Arg Ala  
 85 90 95

Gln Leu Gln Gly Thr Lys Leu Val Leu Ser Val Gly Lys Ser His Gln  
 100 105 110

Asp Glu Val Glu Ala Pro Glu Gly Ile Thr Phe Thr Val Ala Asn Pro  
 115 120 125

Thr Ser Ile Ser Val Glu Gly Ile Asn Lys Glu Val Val Gly Gln Thr  
 130 135 140

Ala Ala Tyr Ile Arg Ser Leu Arg Ser Pro Glu Pro Tyr Lys Gly Lys  
 145 150 155 160

Gly Ile Arg Tyr Val Gly Glu Tyr Val Arg Leu Lys Glu Gly Lys Thr  
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Gly Lys

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 <212> DNA  
 <213> Streptococcus pyogenes

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 <213> Streptococcus pyogenes

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Asn His Gln Gln Gln Glu Ile Val Ser Ser Val Asn Lys Val Lys Ala  
 35 40 45

Leu Thr Ile Lys Glu Ala Met Glu Gln Gly Lys Asp Ile Ser Leu Thr  
 50 55 60

Leu Ala Gly Glu Val Thr Ala Asn Asn Ser Ser Lys Val Lys Ile Asp  
65 70 75 80

Ser Ser Lys Gly Glu Val Lys Glu Val Phe Val Lys Lys Gly Asp Val  
85 90 95

Val Lys Val Gly Gln Pro Leu Phe Ser Tyr Glu Thr Ser Gln Arg Leu  
100 105 110

Thr Ala Gln Ser Ser Glu Phe Asp Val Gln Thr Lys Ala Asn Gln Leu  
115 120 125

Gln Val Ala Lys Thr Asn Ala Ala Leu Lys Trp Glu Thr Tyr Asn Arg  
130 135 140

Lys Val Asn Glu Ile Asn Thr Leu Lys Ser Arg Tyr Asn Thr Ala Pro  
145 150 155 160

Asp Glu Ser Leu Leu Glu Gln Ile Arg Ser Ala Glu Asp Ser Val Ser  
165 170 175

Gln Ala Leu Ser Asp Ala Lys Thr Ala Asp Ser Asp Val Lys Thr Ala  
180 185 190

Gln Ile Glu Leu Asp Lys Ala Asn Ala Thr Ala Thr Thr Glu Lys Gly  
195 200 205

Lys Leu Glu Tyr Asp Thr Val Lys Ser Asp Thr Ala Gly Thr Ile Val  
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Ser Leu Asn Thr Asp Leu Pro Asn Gln Ser Lys Ser Lys Lys Glu Asn  
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Glu Thr Phe Met Glu Ile Ile Asp Lys Ser Lys Met Leu Val Lys Gly  
245 250 255

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260 265 270

Glu Val Ile Asp Arg Lys Asp Asn Ser Lys Lys Trp Thr Gly Lys Val  
275 280 285

Thr Gln Val Gly Asn Leu Lys Ala Glu Glu Lys Gly Gln Gly Gln Gly  
 290 295 300

Gln Gly Gly Asn Asp Gln Gln Asp Asn Pro Asn Gln Ala Lys Phe Pro  
 305 310 315 320

Tyr Val Ile Glu Leu Asp Gln Ser Asp Lys Gln Pro Leu Ile Gly Ser  
 325 330 335

His Thr Tyr Val Asn Val Leu Asn Asn Val Pro Glu Ala Gly Lys Ile  
 340 345 350

Val Leu Lys Glu Thr Phe Thr Met Ala Glu Asn Gly Lys Thr Tyr Val  
 355 360 365

Trp Lys Val Asp Lys Asn Lys Val Lys Lys Gln Glu Ile Lys Thr Lys  
 370 375 380

Pro Phe Ser Lys Gly Tyr Val Glu Val Thr Ser Gly Leu Thr Met Gln  
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Gly Ser Ile Val Lys Pro  
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 <213> Streptococcus pyogenes

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 cctgatatag agttgattgc ttctttgaaa ccaacttgga ttttgagtcc caattcttta 300  
 caagaagatt tggaacccaa gtatcaaaaa ttggatactg agtatgggtt tttgaactta 360  
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 <213> Streptococcus pyogenes

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Gln Gln Arg Ile Val Ala Thr Ser Val Ala Val Val Asp Ile Cys Asp  
 35 40 45

Arg Leu Asn Leu Asp Leu Val Gly Val Cys Asp Ser Lys Leu Tyr Thr  
 50 55 60

Leu Pro Lys Arg Tyr Asp Ala Val Lys Arg Val Gly Leu Pro Met Asn  
 65 70 75 80

Pro Asp Ile Glu Leu Ile Ala Ser Leu Lys Pro Thr Trp Ile Leu Ser  
 85 90 95

Pro Asn Ser Leu Gln Glu Asp Leu Glu Pro Lys Tyr Gln Lys Leu Asp  
 100 105 110

Thr Glu Tyr Gly Phe Leu Asn Leu Arg Ser Val Glu Gly Met Tyr Gln  
 115 120 125

Ser Ile Asp Asp Leu Gly Asn Leu Phe Gln Arg Gln Gln Glu Ala Lys  
 130 135 140

Glu Leu Arg Gln Gln Tyr Gln Asp Tyr Tyr Arg Ala Phe Gln Ala Lys  
 145 150 155 160

Arg Lys Gly Lys Lys Lys Pro Lys Val Leu Ile Leu Met Gly Leu Pro  
 165 170 175

Gly Ser Tyr Leu Val Ala Thr Asn Gln Ser Tyr Val Gly Asn Leu Leu  
 180 185 190

Asp Leu Ala Gly Gly Glu Asn Val Tyr Gln Ser Asp Glu Lys Glu Phe  
 195 200 205

Leu Ser Ala Asn Pro Glu Asp Met Leu Ala Lys Glu Pro Asp Leu Ile  
 210 215 220

Leu Arg Thr Ala His Ala Ile Pro Asp Lys Val Lys Val Met Phe Asp  
 225 230 235 240

Lys Glu Phe Ala Glu Asn Asp Ile Trp Lys His Phe Thr Ala Val Lys  
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Glu Gly Lys Val Tyr Asp Leu Asp Asn Thr Leu Phe Gly Met Ser Ala  
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Lys Leu Asn Tyr Pro Glu Ala Leu Asp Thr Leu Thr Gln Leu Phe Asp  
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His Val Gly Asp His Pro  
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<210> 13  
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<213> Streptococcus pyogenes

<400> 21

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actaaacttg tcctttcagt aggtaaatct caccaagacg aagttgaagc tccagaagga      360
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gttggtcaaa cagctgctta catccgtagc ttgcgttcac cagagcctta caaaggcaaa      480
gggatccggt acgttggtga atacgtacgc cttaaagaag gtaaacagg taaataa      537
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<210> 22

<211> 178

<212> PRT

<213> Streptococcus pyogenes

<400> 22

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Met Ser Arg Ile Gly Asn Lys Val Ile Thr Met Pro Ala Gly Val Glu
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Leu Thr Asn Asn Asn Asn Val Ile Thr Val Lys Gly Pro Lys Gly Glu
          20           25           30
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Leu Thr Arg Glu Phe Asn Lys Asn Ile Glu Ile Lys Val Glu Gly Thr
          35           40           45
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```
Glu Ile Thr Val Val Arg Pro Asn Asp Ser Lys Glu Met Lys Thr Ile
          50           55           60
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His Gly Thr Thr Arg Ala Asn Leu Asn Asn Met Val Val Gly Val Ser
65           70           75           80
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Glu Gly Phe Lys Lys Asp Leu Glu Met Lys Gly Val Gly Tyr Arg Ala
          85           90           95
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Gln Leu Gln Gly Thr Lys Leu Val Leu Ser Val Gly Lys Ser His Gln
          100          105          110
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Asp Glu Val Glu Ala Pro Glu Gly Ile Thr Phe Thr Val Ala Asn Pro  
 115 120 125

Thr Ser Ile Ser Val Glu Gly Ile Asn Lys Glu Val Val Gly Gln Thr  
 130 135 140

Ala Ala Tyr Ile Arg Ser Leu Arg Ser Pro Glu Pro Tyr Lys Gly Lys  
 145 150 155 160

Gly Ile Arg Tyr Val Gly Glu Tyr Val Arg Leu Lys Glu Gly Lys Thr  
 165 170 175

Gly Lys

<210> 23  
 <211> 537  
 <212> DNA  
 <213> Streptococcus pyogenes

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 <212> PRT  
 <213> Streptococcus pyogenes

<400> 24

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25

30

Leu Thr Arg Glu Phe Asn Lys Asn Ile Glu Ile Lys Val Glu Gly Thr  
 35 40 45

Glu Ile Thr Val Val Arg Pro Asn Asp Ser Lys Glu Met Lys Thr Ile  
 50 55 60

His Gly Thr Thr Arg Ala Asn Leu Asn Asn Met Val Val Gly Val Ser  
 65 70 75 80

Glu Gly Phe Lys Lys Asp Leu Glu Met Lys Gly Val Gly Tyr Arg Ala  
 85 90 95

Gln Leu Gln Gly Thr Lys Leu Val Leu Ser Val Gly Lys Ser His Gln  
 100 105 110

Asp Glu Val Glu Ala Pro Glu Gly Ile Thr Phe Thr Val Ala Asn Pro  
 115 120 125

Thr Ser Ile Ser Val Glu Gly Ile Asn Lys Glu Val Val Gly Gln Thr  
 130 135 140

Ala Ala Tyr Ile Arg Ser Leu Arg Ser Pro Glu Pro Tyr Lys Gly Lys  
 145 150 155 160

Gly Ile Arg Tyr Val Gly Glu Tyr Val Arg Leu Lys Glu Gly Lys Thr  
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Gly Lys

<210> 25

<211> 537

<212> DNA

<213> Streptococcus pyogenes

<400> 25

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attgaaatca aagttgaagg gactgaaatc acagttgtac gtcctaacga ctcaaaaagaa 180

atgaaaacaa tccatgggac aaccctgtgt aacttgaata acatgggtgt aggtgtttct 240

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 <213> Streptococcus pyogenes

<400> 26

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Leu Thr Asn Asn Asn Asn Val Ile Thr Val Lys Gly Pro Lys Gly Glu  
 20 25 30

Leu Thr Arg Glu Phe Asn Lys Asn Ile Glu Ile Lys Val Glu Gly Thr  
 35 40 45

Glu Ile Thr Val Val Arg Pro Asn Asp Ser Lys Glu Met Lys Thr Ile  
 50 55 60

His Gly Thr Thr Arg Ala Asn Leu Asn Asn Met Val Val Gly Val Ser  
 65 70 75 80

Glu Gly Phe Lys Lys Asp Leu Glu Met Lys Gly Val Gly Tyr Arg Ala  
 85 90 95

Gln Leu Gln Gly Thr Lys Leu Val Leu Ser Val Gly Lys Ser His Gln  
 100 105 110

Asp Glu Val Glu Ala Pro Glu Gly Ile Thr Phe Thr Val Ala Asn Pro  
 115 120 125

Thr Ser Ile Ser Val Glu Gly Ile Asn Lys Glu Val Val Gly Gln Thr  
 130 135 140

Ala Ala Tyr Ile Arg Ser Leu Arg Ser Pro Glu Pro Tyr Lys Gly Lys  
 145 150 155 160

Gly Ile Arg Tyr Val Gly Glu Tyr Val Arg Leu Lys Glu Gly Lys Thr  
165 170 175

Gly Lys

<210> 27  
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<210> 28  
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<213> Streptococcus pyogenes

<400> 28

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20 25 30

Leu Thr Arg Glu Phe Asn Lys Asn Ile Glu Ile Lys Val Glu Gly Thr  
35 40 45

Glu Ile Thr Val Val Arg Pro Asn Asp Ser Lys Glu Met Lys Thr Ile  
50 55 60

His Gly Thr Thr Arg Ala Asn Leu Asn Asn Met Val Val Gly Val Ser  
65 70 75 80

Glu Gly Phe Lys Lys Asp Leu Glu Met Lys Gly Val Gly Tyr Arg Ala  
85 90 95

Gln Leu Gln Gly Thr Lys Leu Val Leu Ser Val Gly Lys Ser His Gln  
100 105 110

Asp Glu Val Glu Ala Pro Glu Gly Ile Thr Phe Thr Val Ala Asn Pro  
115 120 125

Thr Ser Ile Ser Val Glu Gly Ile Asn Lys Glu Val Val Gly Gln Thr  
130 135 140

Ala Ala Tyr Ile Arg Ser Leu Arg Ser Pro Glu Pro Tyr Lys Gly Lys  
145 150 155 160

Gly Ile Arg Tyr Val Gly Glu Tyr Val Arg Leu Lys Glu Gly Lys Thr  
165 170 175

Gly Lys

<210> 29  
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<212> DNA  
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gctactgccca caacggaaaa aggtaaacta gagtatgaca ccgttaagtc agacaccgca 660  
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tctaaaaaat ggactggaaa agtaacccaa gttggcaacc tcaaagcaga ggaaaaaggc 900  
caagggtcaag gccaagggtg caatgaccaa caagataatc caaaccaagc aaaattccct 960  
tatgttattg aacttgacca atcagacaag cagccactca ttgggtcaca cacctatgtt 1020  
aatgtactca acaatgttcc agaagctggc aagatcgtat tgaaagaaac ctttacaatg 1080  
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atcaagacta agcccttctc aaaagggttat gttgaggtaa caagtggctt gactatgcaa 1200  
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<210> 30  
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<212> PRT  
<213> Streptococcus pyogenes

<400> 30

Met Phe Gln Leu Arg Lys Lys Met Thr Arg Lys Gln Leu Ala Leu Leu  
1 5 10 15

Ser Ala Gly Val Leu Thr Cys Val Val Gly Gly Ser Tyr Leu Ile Met  
20 25 30

Asn His Gln Gln Gln Glu Ile Val Ser Ser Val Asn Lys Val Lys Ala  
35 40 45

Leu Thr Ile Lys Glu Ala Met Glu Gln Gly Lys Asp Ile Ser Leu Thr  
50 55 60

Leu Ala Gly Glu Val Thr Ala Asn Asn Ser Ser Lys Val Lys Ile Asp  
65 70 75 80

Ser Ser Lys Gly Glu Val Lys Glu Val Phe Val Lys Lys Gly Asp Val  
85 90 95

Val Lys Val Gly Gln Pro Leu Phe Ser Tyr Glu Thr Ser Gln Arg Leu  
100 105 110

Thr Ala Gln Ser Ser Glu Phe Asp Val Gln Thr Lys Ala Asn Gln Leu  
115 120 125

Gln Val Ala Lys Thr Asn Ala Ala Leu Lys Trp Glu Thr Tyr Asn Arg  
130 135 140

Lys Val Asn Glu Ile Asn Thr Leu Lys Ser Arg Tyr Asn Thr Ala Pro  
145 150 155 160

Asp Glu Ser Leu Leu Glu Gln Ile Arg Ser Ala Glu Asp Ser Val Ser  
165 170 175

Gln Ala Leu Ser Asp Ala Lys Thr Ala Asp Ser Asp Val Lys Thr Ala  
180 185 190

Gln Ile Glu Leu Asp Lys Ala Asn Ala Thr Ala Thr Thr Glu Lys Gly  
195 200 205

Lys Leu Glu Tyr Asp Thr Val Lys Ser Asp Thr Ala Gly Thr Ile Val  
210 215 220

Ser Leu Asn Thr Asp Leu Pro Asn Gln Ser Lys Ser Lys Lys Glu Asn  
225 230 235 240

Glu Thr Phe Met Glu Ile Ile Asp Lys Ser Lys Met Leu Val Lys Gly  
245 250 255

Asn Ile Ser Glu Phe Asp Arg Asp Lys Leu Lys Ile Gly Gln Lys Val  
260 265 270

Glu Val Ile Asp Arg Lys Asp Asn Ser Lys Lys Trp Thr Gly Lys Val  
275 280 285

Thr Gln Val Gly Asn Leu Lys Ala Glu Glu Lys Gly Gln Gly Gln Gly  
290 295 300

Gln Gly Gly Asn Asp Gln Gln Asp Asn Pro Asn Gln Ala Lys Phe Pro  
305 310 315 320

Tyr Val Ile Glu Leu Asp Gln Ser Asp Lys Gln Pro Leu Ile Gly Ser

325	330	335
His Thr Tyr Val Asn Val Leu Asn Asn Val Pro Glu Ala Gly Lys Ile		
340	345	350
Val Leu Lys Glu Thr Phe Thr Met Ala Glu Asn Gly Lys Thr Tyr Val		
355	360	365
Trp Lys Val Asp Lys Asn Lys Val Lys Lys Gln Glu Ile Lys Thr Lys		
370	375	380
Pro Phe Ser Lys Gly Tyr Val Glu Val Thr Ser Gly Leu Thr Met Gln		
385	390	395 400
Asp Lys Ile Ala Gln Pro Leu Pro Gly Met Lys Asp Gly Met Glu Val		
405	410	415
Gly Ser Ile Val Lys Pro		
420		

<210> 31  
 <211> 1269  
 <212> DNA  
 <213> Streptococcus pyogenes

<400> 31	
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tctagtgtca acaaagtaaa agccttaacc ataaaagaag ccatggaaca aggaaaagat	180
atcagcttga ccttagctgg cgaagtaaca gctaacaaca gcagcaaagt caaaatcgac	240
tcaagtaaag gagaagtcaa agaggtcttt gttaaaaaag gcgatggtgt caaagtagga	300
caacccttgt ttagctatga aacgtcacag cggttaacgg ctcaaagttc agaatttgat	360
gttcaaacca aagccaatca gtcceaagtt gctaaaacca atgcagcatt gaagtgggaa	420
acctacaatc gcaagggtcaa tgaaatcaac accctaaaat ctcgctacaa cactgcacca	480
gatgagagct tactagagca aattcgcagc gcagaagaca gtgtatccca agcactaagc	540
gatgccaaaa cagcagatag cgatgtcaaa accgctcaaa tcgaactcga taaagcta	600
gctactgccca caacggaaaa aggtaaacta gagtatgaca ccgttaagtc agacaccgca	660
ggaaccattg ttagtctaaa tactgatttg ccaaataat caaaatccaa aaaagaaaat	720

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gaaactttta tggaaattat cgacaaatca aaaatgttag tcaaaggtaa cattagttaa 780
tttgaccgtg acaagttaaa aatcgggtcaa aaagtcgaag tgattgaccg caaagacaac 840
tctaaaaaat ggactggaaa agtaacccaa gttggcaacc tcaaagcaga ggaaaaaggc 900
caaggtcaag gccaaaggtgg caatgaccaa caagataatc caaaccaagc aaaattccct 960
tatgttattg aacttgacca atcagacaag cagccactca ttgggtcaca cacctatggt 1020
aatgtactca acaatgttcc agaagctggc aagatcgtat tgaaagaaac ctttacaatg 1080
gcagaaaatg gaaaaaccta tgtgtggaaa gttgataaaa acaaggtcaa aaaacaagaa 1140
atcaagacta agcccttctc aaaagggttat gttgaggtaa caagtggctt gactatgcaa 1200
gataagattg ctccagccgct tcctggcatg aaagacggta tggaggtagg aagtattggt 1260
aaaccttaa 1269

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<210> 32
<211> 422
<212> PRT
<213> Streptococcus pyogenes

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<400> 32

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Met Phe Gln Leu Arg Lys Lys Met Thr Arg Lys Gln Leu Ala Leu Leu
1           5           10           15

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Ser Ala Gly Val Leu Thr Cys Val Val Gly Gly Ser Tyr Leu Ile Met
          20           25           30

```

```

Asn His Gln Gln Gln Glu Ile Val Ser Ser Val Asn Lys Val Lys Ala
          35           40           45

```

```

Leu Thr Ile Lys Glu Ala Met Glu Gln Gly Lys Asp Ile Ser Leu Thr
          50           55           60

```

```

Leu Ala Gly Glu Val Thr Ala Asn Asn Ser Ser Lys Val Lys Ile Asp
65           70           75           80

```

```

Ser Ser Lys Gly Glu Val Lys Glu Val Phe Val Lys Lys Gly Asp Val
          85           90           95

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Val Lys Val Gly Gln Pro Leu Phe Ser Tyr Glu Thr Ser Gln Arg Leu
          100          105          110

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Thr Ala Gln Ser Ser Glu Phe Asp Val Gln Thr Lys Ala Asn Gln Leu

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115	120	125
Gln Val Ala Lys Thr Asn Ala Ala Leu Lys Trp Glu Thr Tyr Asn Arg 130 135 140		
Lys Val Asn Glu Ile Asn Thr Leu Lys Ser Arg Tyr Asn Thr Ala Pro 145 150 155 160		
Asp Glu Ser Leu Leu Glu Gln Ile Arg Ser Ala Glu Asp Ser Val Ser 165 170 175		
Gln Ala Leu Ser Asp Ala Lys Thr Ala Asp Ser Asp Val Lys Thr Ala 180 185 190		
Gln Ile Glu Leu Asp Lys Ala Asn Ala Thr Ala Thr Thr Glu Lys Gly 195 200 205		
Lys Leu Glu Tyr Asp Thr Val Lys Ser Asp Thr Ala Gly Thr Ile Val 210 215 220		
Ser Leu Asn Thr Asp Leu Pro Asn Gln Ser Lys Ser Lys Lys Glu Asn 225 230 235 240		
Glu Thr Phe Met Glu Ile Ile Asp Lys Ser Lys Met Leu Val Lys Gly 245 250 255		
Asn Ile Ser Glu Phe Asp Arg Asp Lys Leu Lys Ile Gly Gln Lys Val 260 265 270		
Glu Val Ile Asp Arg Lys Asp Asn Ser Lys Lys Trp Thr Gly Lys Val 275 280 285		
Thr Gln Val Gly Asn Leu Lys Ala Glu Glu Lys Gly Gln Gly Gln Gly 290 295 300		
Gln Gly Gly Asn Asp Gln Gln Asp Asn Pro Asn Gln Ala Lys Phe Pro 305 310 315 320		
Tyr Val Ile Glu Leu Asp Gln Ser Asp Lys Gln Pro Leu Ile Gly Ser 325 330 335		
His Thr Tyr Val Asn Val Leu Asn Asn Val Pro Glu Ala Gly Lys Ile 340 345 350		

Val Leu Lys Glu Thr Phe Thr Met Ala Glu Asn Gly Lys Thr Tyr Val  
 355 360 365

Trp Lys Val Asp Lys Asn Lys Val Lys Lys Gln Glu Ile Lys Thr Lys  
 370 375 380

Pro Phe Ser Lys Gly Tyr Val Glu Val Thr Ser Gly Leu Thr Met Gln  
 385 390 395 400

Asp Lys Ile Ala Gln Pro Leu Pro Gly Met Lys Asp Gly Met Glu Val  
 405 410 415

Gly Ser Ile Val Lys Pro  
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<210> 33  
 <211> 1269  
 <212> DNA  
 <213> Streptococcus pyogenes

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 tctagtgtca acaaagtaaa agccttaacc ataaaagaag ccatggaaca aggaaaagat 180  
 atcagcttga ccttagctgg cgaagtaaca gctaacaaca gcagcaaagt caaaatcgac 240  
 tcaagtaaag gagaagtcaa agaggtcttt gtcaaaaaag gcgatgttgt caaagtagga 300  
 caacccttgt ttagctatga aacgtcacag cggttaacgg ctcaaagttc agaatttgat 360  
 gttcaaacca aagccaatca actccaagtt gctaaaacca atgcagcatt gaagtgggaa 420  
 acctacaatc gcaaggtcaa tgaaatcaac accctaaaat ctgctacaa cactgcacca 480  
 gatgagagct tactagagca aattcgcagc gcagaagaca gtgtatccca agcactaagc 540  
 gatgccaaaa cagcagatag cgatgtcaaa accgctcaaa tcgaactcga taaagctaatt 600  
 gctactgcca caatggaaaa aggtaacta gagtatgaca ccgttaagtc agacaccgca 660  
 ggaaccattg ttagcctaaa tactgatttg ccaaataaat caaaatccaa aaaagaaaat 720  
 gaaactttta tggaaattat cgacaaatca aaaatgtag tcaaaggtaa catcagttaa 780  
 ttgaccgtg acaagttaaa aatcgatcaa aaagtcgaag tgattgaccg caaagacaac 840  
 tctaaaaaat ggactggaaa agtaacccaa gttggcaacc tcaaagcaga ggaaaaaggc 900

caaggtcaag gccaaaggtgg caatgaccaa caagacaatc caaaccaagc aaaattccct 960  
 tatgttatcg aacttgacca atcagacaag cagccactca ttggctcaca cacctatggt 1020  
 aatgtgctca acaatgttcc agaagctggc aagatcgtat tgaaagaaac ctttacaatg 1080  
 gcagaaaatg gaaaaaccta tgtgtggaaa gttgataaaa acaaggtcaa aaaacaagaa 1140  
 atcaagacta agcccttctc aaaaggttat gttgaggtga caagtggctt gactatgcaa 1200  
 gataagattg ctccagccgct tcctggcatg aaagacggta tggaggtagg aagtattggt 1260  
 aaaccttaa 1269

<210> 34  
 <211> 422  
 <212> PRT  
 <213> Streptococcus pyogenes

<400> 34

Met Phe Gln Leu Arg Lys Lys Met Thr Arg Lys Gln Leu Ala Leu Leu  
 1 5 10 15

Ser Ala Gly Val Leu Thr Cys Val Val Gly Gly Ser Tyr Leu Ile Met  
 20 25 30

Asn His Gln Gln Gln Glu Val Val Ser Ser Val Asn Lys Val Lys Ala  
 35 40 45

Leu Thr Ile Lys Glu Ala Met Glu Gln Gly Lys Asp Ile Ser Leu Thr  
 50 55 60

Leu Ala Gly Glu Val Thr Ala Asn Asn Ser Ser Lys Val Lys Ile Asp  
 65 70 75 80

Ser Ser Lys Gly Glu Val Lys Glu Val Phe Val Lys Lys Gly Asp Val  
 85 90 95

Val Lys Val Gly Gln Pro Leu Phe Ser Tyr Glu Thr Ser Gln Arg Leu  
 100 105 110

Thr Ala Gln Ser Ser Glu Phe Asp Val Gln Thr Lys Ala Asn Gln Leu  
 115 120 125

Gln Val Ala Lys Thr Asn Ala Ala Leu Lys Trp Glu Thr Tyr Asn Arg  
 130 135 140

Lys Val Asn Glu Ile Asn Thr Leu Lys Ser Arg Tyr Asn Thr Ala Pro  
145 150 155 160

Asp Glu Ser Leu Leu Glu Gln Ile Arg Ser Ala Glu Asp Ser Val Ser  
165 170 175

Gln Ala Leu Ser Asp Ala Lys Thr Ala Asp Ser Asp Val Lys Thr Ala  
180 185 190

Gln Ile Glu Leu Asp Lys Ala Asn Ala Thr Ala Thr Met Glu Lys Gly  
195 200 205

Lys Leu Glu Tyr Asp Thr Val Lys Ser Asp Thr Ala Gly Thr Ile Val  
210 215 220

Ser Leu Asn Thr Asp Leu Pro Asn Gln Ser Lys Ser Lys Lys Glu Asn  
225 230 235 240

Glu Thr Phe Met Glu Ile Ile Asp Lys Ser Lys Met Leu Val Lys Gly  
245 250 255

Asn Ile Ser Glu Phe Asp Arg Asp Lys Leu Lys Ile Asp Gln Lys Val  
260 265 270

Glu Val Ile Asp Arg Lys Asp Asn Ser Lys Lys Trp Thr Gly Lys Val  
275 280 285

Thr Gln Val Gly Asn Leu Lys Ala Glu Glu Lys Gly Gln Gly Gln Gly  
290 295 300

Gln Gly Gly Asn Asp Gln Gln Asp Asn Pro Asn Gln Ala Lys Phe Pro  
305 310 315 320

Tyr Val Ile Glu Leu Asp Gln Ser Asp Lys Gln Pro Leu Ile Gly Ser  
325 330 335

His Thr Tyr Val Asn Val Leu Asn Asn Val Pro Glu Ala Gly Lys Ile  
340 345 350

Val Leu Lys Glu Thr Phe Thr Met Ala Glu Asn Gly Lys Thr Tyr Val  
355 360 365

Trp Lys Val Asp Lys Asn Lys Val Lys Lys Gln Glu Ile Lys Thr Lys  
 370 375 380

Pro Phe Ser Lys Gly Tyr Val Glu Val Thr Ser Gly Leu Thr Met Gln  
 385 390 395 400

Asp Lys Ile Ala Gln Pro Leu Pro Gly Met Lys Asp Gly Met Glu Val  
 405 410 415

Gly Ser Ile Val Lys Pro  
 420

<210> 35  
 <211> 1269  
 <212> DNA  
 <213> Streptococcus pyogenes

<400> 35  
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 ttgacctgtg tggttggtgg tacctacttg ataatgaatc atcaacaaca agaaattgtc 120  
 tctagtgtca acaaagtaaa agccttaacc ataaaagaag ccatggaaca aggaaaagat 180  
 atcagcttga ccttagctgg cgaagtaaca gctaacaaca gcagcaaagt caaaatcgac 240  
 tcaagtaaag gagaagtcaa agatgtcttt gtcaaaaaag gcgatggtgt caaagtagga 300  
 caacccttgt ttagctatga aacgtcaca cggttaacgg ctcaaagttc agaatttgat 360  
 gttcaaacca aagccaatca actccaagtt gctaaaacca atgcagcatt gaagtgggaa 420  
 acctacaatc gcaaggtcaa tgaaatcaat accctaaaat ctcgctacaa cactgcacca 480  
 gatgagagct tactagagca aattcgcagc gcagaagaca gtgtatctca agcactaagc 540  
 gatgccaaaa cagcagatag cgatgtcaaa accgctcaaa tcgaactcga taaagctaatt 600  
 gctactgccg caacggaaaa aggtaaacta gagtatgaca ccgttaagtc agacaccgca 660  
 ggaaccattg ttagtctaaa tactgatttg ccaaataat caaaatccaa aaaagaaaat 720  
 gaaactttta tggaattat cgacaaatca aaaatgtag tcaaaggtaa catcagtga 780  
 tttgaccgtg acaagttaaa aatcgatcaa aaagtcgaag tgattgaccg caaagacaac 840  
 tctaaaaaat ggactggaaa agtaacccaa gttggcaacc tcaaagcaga ggaaaaaggc 900  
 caaggtcaag gccaaaggtg caatgaccaa caagataatc caaaccaagc aaaattccct 960  
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gcagaaaatg gaaaaaccta tgtgtggaaa gttgataaaa acaagggtcaa aaaacaagaa 1140  
atcaagacta agcccttctc aaaagggttat gttgaggtga caagcggctt gactatgcaa 1200  
gataagattg ctcagccgct tcttggcatg aaagacggta tggaggtagg aagtattggt 1260  
aaaccttaa 1269

<210> 36  
<211> 422  
<212> PRT  
<213> Streptococcus pyogenes

<400> 36

Met Phe Gln Leu Arg Lys Lys Met Thr Arg Lys Gln Leu Ala Leu Leu  
1 5 10 15

Ser Ala Gly Val Leu Thr Cys Val Val Gly Gly Thr Tyr Leu Ile Met  
20 25 30

Asn His Gln Gln Gln Glu Ile Val Ser Ser Val Asn Lys Val Lys Ala  
35 40 45

Leu Thr Ile Lys Glu Ala Met Glu Gln Gly Lys Asp Ile Ser Leu Thr  
50 55 60

Leu Ala Gly Glu Val Thr Ala Asn Asn Ser Ser Lys Val Lys Ile Asp  
65 70 75 80

Ser Ser Lys Gly Glu Val Lys Asp Val Phe Val Lys Lys Gly Asp Val  
85 90 95

Val Lys Val Gly Gln Pro Leu Phe Ser Tyr Glu Thr Ser Gln Arg Leu  
100 105 110

Thr Ala Gln Ser Ser Glu Phe Asp Val Gln Thr Lys Ala Asn Gln Leu  
115 120 125

Gln Val Ala Lys Thr Asn Ala Ala Leu Lys Trp Glu Thr Tyr Asn Arg  
130 135 140

Lys Val Asn Glu Ile Asn Thr Leu Lys Ser Arg Tyr Asn Thr Ala Pro  
145 150 155 160

Asp Glu Ser Leu Leu Glu Gln Ile Arg Ser Ala Glu Asp Ser Val Ser  
165 170 175

Gln Ala Leu Ser Asp Ala Lys Thr Ala Asp Ser Asp Val Lys Thr Ala  
180 185 190

Gln Ile Glu Leu Asp Lys Ala Asn Ala Thr Ala Ala Thr Glu Lys Gly  
195 200 205

Lys Leu Glu Tyr Asp Thr Val Lys Ser Asp Thr Ala Gly Thr Ile Val  
210 215 220

Ser Leu Asn Thr Asp Leu Pro Asn Gln Ser Lys Ser Lys Lys Glu Asn  
225 230 235 240

Glu Thr Phe Met Glu Ile Ile Asp Lys Ser Lys Met Leu Val Lys Gly  
245 250 255

Asn Ile Ser Glu Phe Asp Arg Asp Lys Leu Lys Ile Asp Gln Lys Val  
260 265 270

Glu Val Ile Asp Arg Lys Asp Asn Ser Lys Lys Trp Thr Gly Lys Val  
275 280 285

Thr Gln Val Gly Asn Leu Lys Ala Glu Glu Lys Gly Gln Gly Gln Gly  
290 295 300

Gln Gly Gly Asn Asp Gln Gln Asp Asn Pro Asn Gln Ala Lys Phe Pro  
305 310 315 320

Tyr Val Ile Glu Leu Asp Gln Ser Asp Lys Gln Pro Leu Ile Gly Ser  
325 330 335

His Thr Tyr Val Asn Val Leu Asn Asn Val Pro Glu Ala Gly Lys Ile  
340 345 350

Val Leu Lys Glu Thr Phe Thr Met Ala Glu Asn Gly Lys Thr Tyr Val  
355 360 365

Trp Lys Val Asp Lys Asn Lys Val Lys Lys Gln Glu Ile Lys Thr Lys  
370 375 380

Pro Phe Ser Lys Gly Tyr Val Glu Val Thr Ser Gly Leu Thr Met Gln  
 385 390 395 400

Asp Lys Ile Ala Gln Pro Leu Pro Gly Met Lys Asp Gly Met Glu Val  
 405 410 415

Gly Ser Ile Val Lys Pro  
 420

<210> 37  
 <211> 885  
 <212> DNA  
 <213> Streptococcus pyogenes

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 aaattatata cccttcctaa acgctatgat gctgttaagc gtgtggggtt acccatgaat 240  
 cctgatatag agttgattgc ttctttgaaa ccaacttgga ttttgagtcc caattcttta 300  
 caagaagatt tggaacccaa gtatcaaaaa ttggatactg agtatgggtt tttgaactta 360  
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 cctgacttga ttttacgaac agctcacgcc attccagaca aggtaaaagt gatgtttgac 720  
 aaagaatttg ctgaaaatga tatttggaac cattttacgg cagtcaagga agggaaagtc 780  
 tatgatttgg acaataccct gtttggcatg agtgctaaat tgaactaccc agaagccttg 840  
 gacaccttaa cacagctttt tgaccacgtg ggagatcatc cgtaa 885

<210> 38  
 <211> 294  
 <212> PRT  
 <213> Streptococcus pyogenes

<400> 38

Met Ile Lys Arg Cys Lys Gly Ile Gly Leu Val Leu Met Ala Phe Phe

1	5	10	15
Leu Val Ala Cys Val Asn Gln His Pro Lys Thr Ala Lys Glu Thr Glu	20	25	30
Gln Gln Arg Ile Val Ala Thr Ser Val Ala Val Val Asp Ile Cys Asp	35	40	45
Arg Leu Asn Leu Asp Leu Val Gly Val Cys Asp Ser Lys Leu Tyr Thr	50	55	60
Leu Pro Lys Arg Tyr Asp Ala Val Lys Arg Val Gly Leu Pro Met Asn	65	70	75
Pro Asp Ile Glu Leu Ile Ala Ser Leu Lys Pro Thr Trp Ile Leu Ser	85	90	95
Pro Asn Ser Leu Gln Glu Asp Leu Glu Pro Lys Tyr Gln Lys Leu Asp	100	105	110
Thr Glu Tyr Gly Phe Leu Asn Leu Arg Ser Val Glu Gly Met Tyr Gln	115	120	125
Ser Ile Asp Asp Leu Gly Asn Leu Phe Gln Arg Gln Gln Glu Ala Lys	130	135	140
Glu Leu Arg Gln Gln Tyr Gln Asp Tyr Tyr Arg Ala Phe Gln Ala Lys	145	150	155
Arg Lys Gly Lys Lys Lys Pro Lys Val Leu Ile Leu Met Gly Leu Pro	165	170	175
Gly Ser Tyr Leu Val Ala Thr Asn Gln Ser Tyr Val Gly Asn Leu Leu	180	185	190
Asp Leu Ala Gly Gly Glu Asn Val Tyr Gln Ser Asp Glu Lys Glu Phe	195	200	205
Leu Ser Val Asn Pro Glu Asp Met Leu Ala Lys Glu Pro Asp Leu Ile	210	215	220
Leu Arg Thr Ala His Ala Ile Pro Asp Lys Val Lys Val Met Phe Asp	225	230	235
			240

Lys Glu Phe Ala Glu Asn Asp Ile Trp Lys His Phe Thr Ala Val Lys  
245 250 255

Glu Gly Lys Val Tyr Asp Leu Asp Asn Thr Leu Phe Gly Met Ser Ala  
260 265 270

Lys Leu Asn Tyr Pro Glu Ala Leu Asp Thr Leu Thr Gln Leu Phe Asp  
275 280 285

His Val Gly Asp His Pro  
290

<210> 39  
<211> 885  
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<400> 39  
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gttgctgtgg ttgatatctg tgaccgttta aatttagacc tcgttggggg ttgtgatagt 180  
aaattatata cccttcctaa acgctatgat gctgttaagc gtgtggggtt acccatgaat 240  
cctgatatag agttgattgc ttctttgaaa ccaacttgga ttttgagtcc caattcctta 300  
caagaagatt tggaacccaa gtatcaaaaa ttggatactg agtatgggtt tttgaactta 360  
cgaagtgttg agggcatgta ccagtctatt gatgatttag ggaacctttt ccaacgtcaa 420  
caagaagcaa aagaattgcg ccagcaatac caggactatt atcgtgcttt ccaagctaaa 480  
cgcaagggga agaaaaagcc taaagtgctt attcttatgg gcttgccagg tagttatttg 540  
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cctgacttga ttttacgaac agctcacgcc attccagaca aggtaaaagt gatgtttgac 720  
aaagaatttg ctgaaaatga tatttggaat cattttacgg cagtcaagga agggaaagtc 780  
tatgatttgg acaataccct gtttggcatg agtgctaaat tgaactaccc agaagccttg 840  
gacaccttaa cacagctttt tgaccacgtg ggagatcatc cgtaa 885

<210> 40  
<211> 294

<212> PRT

<213> Streptococcus pyogenes

<400> 40

Met Ile Lys Arg Cys Lys Gly Ile Gly Leu Val Leu Met Ala Phe Phe  
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Leu Val Ala Cys Val Asn Gln His Pro Lys Thr Ala Lys Glu Thr Glu  
20 25 30

Gln Gln Arg Ile Val Ala Thr Ser Val Ala Val Val Asp Ile Cys Asp  
35 40 45

Arg Leu Asn Leu Asp Leu Val Gly Val Cys Asp Ser Lys Leu Tyr Thr  
50 55 60

Leu Pro Lys Arg Tyr Asp Ala Val Lys Arg Val Gly Leu Pro Met Asn  
65 70 75 80

Pro Asp Ile Glu Leu Ile Ala Ser Leu Lys Pro Thr Trp Ile Leu Ser  
85 90 95

Pro Asn Ser Leu Gln Glu Asp Leu Glu Pro Lys Tyr Gln Lys Leu Asp  
100 105 110

Thr Glu Tyr Gly Phe Leu Asn Leu Arg Ser Val Glu Gly Met Tyr Gln  
115 120 125

Ser Ile Asp Asp Leu Gly Asn Leu Phe Gln Arg Gln Gln Glu Ala Lys  
130 135 140

Glu Leu Arg Gln Gln Tyr Gln Asp Tyr Tyr Arg Ala Phe Gln Ala Lys  
145 150 155 160

Arg Lys Gly Lys Lys Lys Pro Lys Val Leu Ile Leu Met Gly Leu Pro  
165 170 175

Gly Ser Tyr Leu Val Ala Thr Asn Gln Ser Tyr Val Gly Asn Leu Leu  
180 185 190

Asp Leu Ala Gly Gly Glu Asn Val Tyr Gln Ser Asp Glu Lys Glu Phe  
195 200 205

Leu Ser Val Asn Pro Glu Asp Met Leu Ala Lys Glu Pro Asp Leu Ile  
 210 215 220

Leu Arg Thr Ala His Ala Ile Pro Asp Lys Val Lys Val Met Phe Asp  
 225 230 235 240

Lys Glu Phe Ala Glu Asn Asp Ile Trp Lys His Phe Thr Ala Val Lys  
 245 250 255

Glu Gly Lys Val Tyr Asp Leu Asp Asn Thr Leu Phe Gly Met Ser Ala  
 260 265 270

Lys Leu Asn Tyr Pro Glu Ala Leu Asp Thr Leu Thr Gln Leu Phe Asp  
 275 280 285

His Val Gly Asp His Pro  
 290

<210> 41  
 <211> 885  
 <212> DNA  
 <213> Streptococcus pyogenes

<400> 41  
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 gtgaatcagc accctaaaac ggctaaagag actgaacagc agagaattgt agccacttcg 120  
 gttgctgtgg ttgatattctg tgaccgttta aatttagacc tcgttgggggt ttgtgatagt 180  
 aaattatata cccttcctaa acgctatgat gctgttaagc gtgtggggtt acccatgaat 240  
 cctgatatag agttgattgc ttctttgaaa ccaacttgga ttttgagtcc caattcttta 300  
 caagaagatt tggaacccaa gtatcaaaaa ttggatactg agtatgggtt tttgaactta 360  
 cgaagtgttg agggcatgta ccagtccatt gatgatttag ggaacctttt ccaacgtcaa 420  
 caagaagcaa aagaattgag ccagcaatac caggactatt atcgtgcttt ccaagctaaa 480  
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 gtggcgacga accaatctta tgtagggaat cttttggatt tggcaggtgg tgagaatggt 600  
 tatcagtcag atgagaaaga atttctatca gctaatacctg aagacatgct ggctaaggag 660  
 cctgatttga ttttacgaac agctcacgcc attccagaca aggtaaaagt gatgtttgac 720  
 aaagaatttg ctgaaaatga tatttggaac cattttacgg cagtcaagga agggaaagtc 780  
 tatgatttgg acaataccct gtttggcatg agtgctaaat tgaactaccc agaagccttg 840

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<212> PRT  
<213> Streptococcus pyogenes

<400> 42

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20 25 30

Gln Gln Arg Ile Val Ala Thr Ser Val Ala Val Val Asp Ile Cys Asp  
35 40 45

Arg Leu Asn Leu Asp Leu Val Gly Val Cys Asp Ser Lys Leu Tyr Thr  
50 55 60

Leu Pro Lys Arg Tyr Asp Ala Val Lys Arg Val Gly Leu Pro Met Asn  
65 70 75 80

Pro Asp Ile Glu Leu Ile Ala Ser Leu Lys Pro Thr Trp Ile Leu Ser  
85 90 95

Pro Asn Ser Leu Gln Glu Asp Leu Glu Pro Lys Tyr Gln Lys Leu Asp  
100 105 110

Thr Glu Tyr Gly Phe Leu Asn Leu Arg Ser Val Glu Gly Met Tyr Gln  
115 120 125

Ser Ile Asp Asp Leu Gly Asn Leu Phe Gln Arg Gln Gln Glu Ala Lys  
130 135 140

Glu Leu Arg Gln Gln Tyr Gln Asp Tyr Tyr Arg Ala Phe Gln Ala Lys  
145 150 155 160

Arg Lys Gly Lys Lys Lys Pro Lys Val Leu Ile Leu Met Gly Leu Pro  
165 170 175

Gly Ser Tyr Leu Val Ala Thr Asn Gln Ser Tyr Val Gly Asn Leu Leu  
180 185 190

Asp Leu Ala Gly Gly Glu Asn Val Tyr Gln Ser Asp Glu Lys Glu Phe  
 195 200 205

Leu Ser Ala Asn Pro Glu Asp Met Leu Ala Lys Glu Pro Asp Leu Ile  
 210 215 220

Leu Arg Thr Ala His Ala Ile Pro Asp Lys Val Lys Val Met Phe Asp  
 225 230 235 240

Lys Glu Phe Ala Glu Asn Asp Ile Trp Lys His Phe Thr Ala Val Lys  
 245 250 255

Glu Gly Lys Val Tyr Asp Leu Asp Asn Thr Leu Phe Gly Met Ser Ala  
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Arg Val Gly Asp His Pro  
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 gttgctgtgg ttgatatctg tgaccgttta aatttagacc tcgttggggg ttgtgatagt 180  
 aaattatata cccttcctaa acgctatgat gctgttaagc gtgtggggtt acccatgaat 240  
 cctgatatag agttgattgc ttctttgaaa ccaacttgga ttttgagtcc caattcttta 300  
 caagaagatt tggaacccaa gtatcaaaaa ttggatactg agtatgggtt tttgaactta 360  
 cgaagtgttg agggcatgta ccagtctatt gatgatttag ggaacctttt ccaacgtcaa 420  
 caagaagcaa aagaattgag ccagcaatac caggactatt atcgtgcttt ccaagctaaa 480  
 cgtaagggga agaaaaagcc taaagtgctt attcttatgg gcttgccagg tagttatttg 540  
 gtggcgacga accaatctta tgtagggaat cttttggact tggcaggtgg tgagaatggt 600  
 tatcagtcag atgagaaaga atttctatca gttaatcctg aagacatgct agctaaggag 660

cctgacttga ttttacgaac agctcacgcc attccagaca aggtaaaagt gatgtttgac 720  
aaagaatttg ctgaaaatga tatttggaac cattttacgg cagtcaagga agggaaagtc 780  
tatgatttgg acaataccct gtttggcatg agtgctaaat tgaactaccc agaagccttg 840  
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Met Ile Lys Arg Cys Lys Gly Ile Gly Leu Val Leu Met Ala Phe Phe  
1 5 10 15

Leu Val Ala Cys Val Asn Gln His Pro Lys Thr Ala Lys Glu Thr Glu  
20 25 30

Gln Gln Arg Ile Val Ala Thr Ser Val Ala Val Val Asp Ile Cys Asp  
35 40 45

Arg Leu Asn Leu Asp Leu Val Gly Val Cys Asp Ser Lys Leu Tyr Thr  
50 55 60

Leu Pro Lys Arg Tyr Asp Ala Val Lys Arg Val Gly Leu Pro Met Asn  
65 70 75 80

Pro Asp Ile Glu Leu Ile Ala Ser Leu Lys Pro Thr Trp Ile Leu Ser  
85 90 95

Pro Asn Ser Leu Gln Glu Asp Leu Glu Pro Lys Tyr Gln Lys Leu Asp  
100 105 110

Thr Glu Tyr Gly Phe Leu Asn Leu Arg Ser Val Glu Gly Met Tyr Gln  
115 120 125

Ser Ile Asp Asp Leu Gly Asn Leu Phe Gln Arg Gln Gln Glu Ala Lys  
130 135 140

Glu Leu Arg Gln Gln Tyr Gln Asp Tyr Tyr Arg Ala Phe Gln Ala Lys  
145 150 155 160

Arg Lys Gly Lys Lys Lys Pro Lys Val Leu Ile Leu Met Gly Leu Pro  
165 170 175

Gly Ser Tyr Leu Val Ala Thr Asn Gln Ser Tyr Val Gly Asn Leu Leu  
180 185 190

Asp Leu Ala Gly Gly Glu Asn Val Tyr Gln Ser Asp Glu Lys Glu Phe  
195 200 205

Leu Ser Val Asn Pro Glu Asp Met Leu Ala Lys Glu Pro Asp Leu Ile  
210 215 220

Leu Arg Thr Ala His Ala Ile Pro Asp Lys Val Lys Val Met Phe Asp  
225 230 235 240

Lys Glu Phe Ala Glu Asn Asp Ile Trp Lys His Phe Thr Ala Val Lys  
245 250 255

Glu Gly Lys Val Tyr Asp Leu Asp Asn Thr Leu Phe Gly Met Ser Ala  
260 265 270

Lys Leu Asn Tyr Pro Glu Ala Leu Asp Thr Leu Thr Gln Leu Phe Asp  
275 280 285

His Val Gly Asp His Pro  
290